

## **AGRICULTURE ENERGY PROGRAM PROJECTS**

### **Title: “A Farmer Education and Demonstration Program for Biofuel Feedstock Production in Alabama”**

**Auburn University – Dr. David Bransby and Dr. Carla Shoemaker**

The objective of this project is to conduct demonstrations and educational activities to instruct farmers on how to grow non-traditional energy crops for biofuel production. A seminar for county extension agents and three field days for farmers and county extension agents will be held providing information and instruction on energy crop production, harvesting and transport, and bioenergy in general. In conjunction with the field days and through county agents and additional meetings as necessary, farmers will be recruited and signed up to supply feedstock to Alabama’s first cellulosic biofuel production facility. In addition, five to ten farmers will be identified to plant and establish 10-acre test plots of Alamo switchgrass. Another phase of the project will involve the establishment, demonstration and evaluation of low input alternative energy crops (sugarcane, sweet sorghum, turnips, sugar beets, cassava, and sweet potatoes) for small scale biofuel production. Biofuel conversion equipment will be tested and data collected on the conversion of various crops to biofuel. These components will then be integrated into a total system approach and evaluated on an economic basis for the small scale production of biofuel on farms in Alabama. Byproducts from the conversion process will be utilized to assess palatability and growth performance of livestock.

### **Title: “Demonstrating Combined Heat and Power Generation from Biomass Residues Indigenous to Alabama”**

**Auburn University - Dr. Oladiran Fasina, Dr. Tim McDonald, and Dr. John Fulton**

Auburn University will demonstrate a BioMax 25 modular bipower system designed to use gasification technology to convert a variety of biomass residues (e.g. wood chips, nutshells, pits, prunings, pelletized agricultural materials including switchgrass, poultry litter, and corn stover) into power, heat/cooling, and liquid fuels for farmers, enterprises, schools, homes and small communities. The system will be purchased and retrofitted so that it can be transported and demonstrated on a mobile trailer. The system will be demonstrated at major on-campus events, a poultry farm, and at a minimum of twelve stops on a tour throughout the state. This statewide tour will include stops at regional extension offices, public schools and colleges, the state capitol building, and agricultural-based facilities across the state.

### **Title: “Biodiesel Production and its Added-Value Products for Small Farms”**

**Alabama A&M University – Dr. Ernest Cebert, Dr. Rufina Ward, Dr. Josh Herring, and Dr. Gamal Adrahim**

Alabama A&M will establish an outreach program to demonstrate and educate farmers about the feasibility and economic benefits of growing canola for small scale biodiesel production and additional value-added products for agricultural operations. 5-10 acres of winter canola will be grown in five locations across the state (Limestone, Madison, Marshall, Lee, and Baldwin Counties). Each location will be used as a demonstration site to educate area farmers on production practices for winter canola. The canola will be harvested and oil will be extracted from the seeds and converted to biodiesel on-site at each location. A variety of pelletized food products will be formulated and produced from the canola meal for fish farming, poultry and small ruminant production, and fertilizer / soil amendments for organic crop production. The canola meal will also be used in combination with other plentiful resources such as saw dust and poultry litter to formulate solid fuel pellets with high Btu capacity for potential combined heat and power use.

**Title: “Low Pressure Nozzles – Improving Irrigation Energy Efficiency”**

**Alabama Cooperative Extension System – Mark Hall, Dr. John Fulton, Jim Langcuster**

This project will demonstrate the energy efficiency of retrofitting irrigation systems with low pressure drop nozzles at six to twelve farms in the state. An energy cost reduction of 45% is expected from these retrofits. Energy usage and cost data will be collected and analyzed with project results disseminated at grower production meetings, published in regional farm publications and electronic media and included in Extension sponsored farm tours.

**Title: “Low-Cost Energy Retrofits for Alabama Broiler Houses Using Emerging Sealing, Insulation, and Lighting Technologies”**

**Auburn University – Dr. Jim Donald, Dr. Eugene Simpson, and Jesse Campbell**

Auburn University will demonstrate and compare energy savings for poultry farms through alternative sealing and insulating technology combinations and cold cathode lighting retrofits. The project will be conducted at two poultry farms in Blount County. Data including propane and electricity consumption and cost, total energy usage and cost, pounds of live weight produced, feed conversion and standard cost will be recorded and analyzed. Results of the project will be disseminated through instructional on-farm demonstration tours, educational meetings, and Extension educational materials.